



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,673	09/17/2003	Hiroya Kirimura	TGW-0202	2468

23353 7590 09/08/2005

RADER FISHMAN & GRAUER PLLC
LION BUILDING
1233 20TH STREET N.W., SUITE 501
WASHINGTON, DC 20036

EXAMINER

ARANCIBIA, MAUREEN GRAMAGLIA

ART UNIT	PAPER NUMBER
----------	--------------

1763

DATE MAILED: 09/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/663,673

Applicant(s)

KIRIMURA ET AL.

Examiner

Maureen G. Arancibia

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
4a) Of the above claim(s) 5-13 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-4 and 14 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed 01/14/2005 fails to fully comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent, publication, or other information listed that is not in the English language, specifically, the Japanese Patent Office Action mailed on 01/04/2005. It has been placed in the application file, but the information referred to in the Non Patent Literature section has not been considered.

Claim Objections

2. Claims 1-4 and 14 are objected to because of the following informalities: The phrase "power source" is misspelled on Line 13 of Claim 1. Claims 2-4 and 14 are objected to due to their dependence on Claim 1. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Application Publication 06-275543 to Okamoto et al. in view of U.S. Patent 6,468,387 to Ahn. The following rejection refers to the Figures and English Machine Translation of Okamoto et al.**

Okamoto et al. teaches an apparatus (Figure 1) for forming a thin film (Paragraph 16), comprising a vacuum container 1 with an exhausting device 11 (Paragraph 11); a gas supplying device opposed to the surface of article 3, with a gas supply surface portion 4 and gas supply holes 41; a power applying device including a power applying electrode 5 disposed in a surrounding region around a space between the article to be coated and the gas supply surface 4 (Figure 1; Paragraph 13); and power supply 51 connected to electrode 5, which produces a uniform plasma from the gas (Figure 1; Paragraphs 19 and 20). The article 3 is disposed on a grounded supporting member 2. (Figure 1)

Okamoto et al. does not expressly teach that the gas supply member can be disposed in the vacuum container without connection to the power source for forming the plasma.

Ahn teaches that a gas supply member 38 can be disposed in a vacuum container 12 without connection to a power source for forming the plasma. (Figure 7; Column 7, Lines 8-16) The power source 32 for forming the plasma is connected to power applying electrodes 24, 25, 26, 27. (Figure 6)

It would have been obvious to one of ordinary skill in the art to modify the apparatus taught by Okamoto et al. to have the gas supply member not be connected to the power source for forming the plasma, as taught by Ahn. The motivation for making such a modification, as taught by Ahn (Column 5, Line 40 - Column 7, Line 44), would have been to introduce the reactive gas from above the plasma generated by the power

applying electrodes, so that the gas passes through the uniform, dense plasma on its way to the article to be processed.

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto et al. in view of Ahn as applied to Claim 1 above, and further in view of U.S. Patent 5,422,139 to Fischer.

The teachings of Okamoto et al. and Ahn were discussed above.

The combination of Okamoto et al. and Ahn does not expressly teach that the exhausting device can discharge gas from the vicinity of the periphery portion of the gas supply member.

Fischer teaches that gas can be discharged through channels 5 and 18 that are on the periphery portion of the gas supply member 12. (Figure 4; Column 8, Lines 34-48)

It would have been obvious to one of ordinary skill in the art to modify the apparatus taught by the combination of Okamoto et al. and Ahn to have the exhausting device discharge gas from the vicinity of the periphery portion of the gas supply member, as taught by Fischer. The motivation for making such a modification, as taught by Fischer (Column 3, Lines 28-58), would have been to optimize the gas flow in order to prevent large area gas flow across the surface of the substrate, which prevents the gas from fully reacting.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto et al. in view of Ahn as applied to Claim 1 above, and further in view of U.S. Patent 5,404,079 to Ohkuni et al. and U.S. Patent 6,099,687 to Yamazaki.

The teachings of Okamoto et al. and Ahn were discussed above. Specifically, Okamoto et al. teaches that the power applying device includes one electrode 5 surrounding the space between the article 3 to be coated and the gas supply surface 4.

The combination of Okamoto et al. and Ahn does not expressly teach that the power applying device should include four divided electrodes, each with a high frequency power source, that each electrodes should have a bent shape, or that the electrodes should be disposed in a quadrilateral shape.

Ohkuni et al. teaches a power applying device including four divided electrodes 2A-2D, each with a bent shape and a high frequency power source 3A-3D. (Figure 12; Column 10, Lines 49-64)

Yamazaki teaches that four divided electrodes 161A-161D can be disposed in a quadrilateral shape. (Figure 2)

It would have been obvious to one of ordinary skill in the art to modify the apparatus taught by the combination of Okamoto et al. and Ahn for the power applying device to include four divided electrodes, each with a bent shape and a high frequency power source, as taught by Ohkuni et al., and to dispose them in a quadrilateral shape, as taught by Yamakazi. The motivation for including four divided electrodes, each with a high frequency power source, as taught by Ohkuni et al. (Column 3, Lines 1-7 and 28-30; Column 10, Line 49 - Column 11, Line 10), would have been to create a uniform, rotating electric field and a highly dense plasma. The motivation for disposing the electrodes in a quadrilateral shape, as taught by Yamakazi (Column 1, Lines 53-56), would have been to create a uniform plasma for processing large and/or square

Art Unit: 1763

substrates. The motivation for having each electrode with a bent shape (i.e. disposing the electrodes in the corners of the quadrilateral chamber), as taught by Ohkuni et al. (Figure 12; Column 6, Lines 12-13; Column 10, Lines 56-61), would have been to place the divided electrodes around the entire periphery of the chamber.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto et al. in view of Ahn as applied to Claim 1, and further in view of Japanese Patent Application Publication 2001-189308 to Fujita et al. The following rejection refers to the Figures and English Abstract of Fujita et al.

The teachings of Okamoto et al. and Ahn were discussed above.

The combination of Okamoto et al. and Ahn does not expressly teach that the distribution density and area of opening of the gas supply holes vary with radial distance from the center of the gas supply surface.

Fujita et al. teaches that the distribution density and area of opening of the gas supply holes 51, 52, 53 vary with radial distance from the center of the gas supply surface 54. (Figure 7; Solution section of English Abstract)

It would have been obvious to one of ordinary skill in the art to modify the gas supply surface taught by the combination of Okamoto et al. and Ahn to vary the distribution density and area of opening of the gas supply holes with radial distance from the center of the surface, as taught by Fujita et al. The motivation for making such a modification, as taught by Fujita et al. (Solution section of English Abstract), would have been to improve the uniformity of the rate of film formation and the quality of the formed film.

Art Unit: 1763

8. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto et al. in view of Ahn as applied to Claim 1 above, and further in view of U.S. Patent 5,958,140 to Arami et al.

The teachings of Okamoto et al. and Ahn were discussed above.

The combination of Okamoto et al. and Ahn does not expressly teach that the gas supply portion of the gas supply member has a first and second set of gas supply holes in fluidic independence of each other.

Arami et al. teaches that the gas supply portion of gas supply member 35 includes a first and second set of gas supply holes 48 in fluidic independence of each other. Each set is connected to a gas supply 41, 42 via independent gas chambers 37A, 37B separated by partitioning wall 36A. (Figure 2)

It would have been obvious to one of ordinary skill in the art to modify the apparatus taught by the combination of Okamoto et al. and Ahn to have the gas supply portion of the gas supply member include a first and second set of gas supply holes in fluidic independence of each other, as taught by Arami et al. The motivation for making such a modification, as taught by Arami et al. (Column 10, Lines 23-44), would have been to allow the supply amounts of processing gas to be independently changed for different zones, allowing various types of films to be formed in various processes with high in-plane uniformity.

Response to Arguments

9. Applicant's arguments with respect to claims 1-4 and 14 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

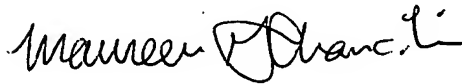
10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maureen G. Arancibia whose telephone number is (571) 272-1219. The examiner can normally be reached on core hours of 10-5, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Maureen G. Arancibia
Patent Examiner, AU 1763



PARVIZ HASSANZADEH
SUPERVISORY PATENT EXAMINER